F. AIR QUALITY

a. Existing Conditions

Mt. Pleasant is located in Westchester County, which is part of the New York Metropolitan Air Quality Control Region and part of NYSDEC Region 3. As of March 2, 2006, Westchester County met the NAAQS for all pollutants except ozone and PM2.5. Its non-attainment status is designated as moderate for ozone. Prior to 2002, the county also was part of a non-attainment area for CO. It is now designated as a CO maintenance area and is subject to the same requirements as a CO non-attainment area. A CO maintenance area must maintain the NAAQS for 20 years by following two sequential 10-year plans.

Table III/F-1 shows the pollutant concentrations for the air quality monitors closest to the site. The White Plains, Mt. Ninham, and Wallkill monitors are located in NYSDEC Region 3 and the Morrisania, IS-52, and Botanical Gardens monitors are located in the Bronx in NYSDEC Region 2.

Table III/F-1

2005 Existing Air Quality

Pollutant	Averaging Period	Standard	Value	Monitor
Sulfur Dioxide	12-month arithmetic mean	30 ppb	2.2 ppb	Mt. Ninham (Putnam)
	24-hour average	14 ppb	12.2 ppb	
	3-hour average	500 ppb	22.6 ppb	
Inhalable Particulates (PM10)	Annual arithmetic mean	50 ug/m3	18 ug/m3 (2004)	IS52 (Bronx)
	24-hour average	150 ug/m3	49 ug/m3 (2004)	
Inhalable Particulates (PM2.5)	Annual arithmetic mean**	15 ug/m3	11.0 ug/m3	White Plains (Westchester)
	Maximum 24-hour average **	65 ug/m3	44.5 ug/m3	
Carbon Monoxide	8-hour average**	9 ppm	2.5 ppm	Botanical Gardens (Bronx)
	1-hour average**	35 ppm	3.9 ppm	
Ozone	Maximum daily 1-hr average Maximum daily 8-hr average**	0.12 pm 0.08 ppm	0.141 ppm 0.096 ppm	Mt. Ninham (Westchester)
Nitrogen Dioxide	12-month arithmetic mean	0.053 ppm	0.027 ppm	Botanical Gardens (Bronx)
Lead	Quarterly mean	1.5 ug/m3	0.24 ug/m3 (2004)	Wallkill (Orange)

*Notes: * Included for information only. These PM2.5 and 8-hour ozone standards have not yet been implemented.*

*** Not to be exceeded more than once a year.*

Source: U.S. Environmental Protection Agency, New York State Department of Environmental Conservation, and New York City Department of Environmental Protection

The principal pollutant associated with vehicular emissions is carbon monoxide (CO). Approximately 80 percent of atmospheric CO emissions are attributable to vehicular emissions. These emissions, associated with the incomplete combustion of fossil fuel, tend to increase as vehicle speed decrease and are maximized during idling and acceleration modes.

b. Project Proposal/Impacts

1. Traffic CO Screening Analysis

The first component of the analysis focuses on local (microscale) carbon monoxide concentration from site generated traffic. CO air quality guidelines and protocols described in this section are based on the NYSDOT Environmental Procedures Manual (EPM), Chapter 1.1 (January 2001). The scope of analysis includes microscale carbon monoxide (CO) concentrations, parking lot CO concentrations, and construction impacts evaluation.

Six categories for level of service (LOS) define the traffic operations at an intersection or approach. The traffic LOS is typically calculated for each intersection approach, as well as the intersection as a whole. In the tables that follow, the overall LOS for an intersection is represented by a capital letter while the individual approaches are shown in lower case letters. For signalized intersections, the overall LOS is a key indication of intersection congestion. For unsignalized intersections, however, the LOSs on minor approaches are of primary concern because the major approaches are free-flow links, and their traffic does not stop at the unsignalized intersection. The minor approach with the poorest LOS is termed the critical movement or critical approach.

The NYSDOT *Environmental Procedures Manual* provides screening criteria for determining whether a microscale CO analysis should be carried out for an intersection. The first criterion is a level of service (LOS) screening. Intersections with a projected LOS of A, B, or C under Build Conditions are generally excluded from microscale CO analysis. Intersections with an overall LOS of D or worse under Build Conditions are further evaluated using NYSDOT's capture screening criteria:

Under Build Conditions, signalized intersections with an overall LOS D or worse, as well as unsignalized intersections projected to experience LOS D or worse on a minor approach, are further screened by the following NYSDOT capture screening criteria (applied to the change between the No-Build and Build Conditions):

- A 10 percent or more increase in traffic volume;

  A reduction of 10 percent (or more) in the source-receptor distance, (i.e., the straight line distance between the edge of the travel lane closest to the receptor and that point of the receptor closest to the roadway);
- A decrease of 20 percent (or more) in speed, where the existing speed is 48 km/h (30 mph) or less;
- An increase in the number of queued lanes at an intersection;
- A 10 percent or more increase in vehicular emissions due to changes in speed, traffic mix, etc.; and,
- Potential impacts on an intersection evaluated for CO in the State Implementation Plan (SIP).

In general, intersections with relatively high traffic volumes coupled with high project-generated increases in traffic typically constitute the worst-case conditions for the purposes of a screening analysis. They would include those intersections with a potential increase in emissions of 10% or more. No changes in traffic mix (relative proportion of cars and trucks) are projected for the intersections analyzed within the study area. The project area does not encompass any intersections used by NYSDOT to demonstrate compliance with the NAAQS in the SIP. Therefore, the key capture screening criteria for the screening analysis are a 10% increase in traffic volume and a 20% decrease in speed between the No-Build and Build Conditions.

The CO screening analysis is presented in Appendix 3 and demonstrates that all intersections screen out and that a full CO modeling analysis is not required.

2. Traffic PM10/PM2.5 Screening Analysis

Vehicles that use diesel fuel are a source of fine particulate emissions (PM10 and PM2.5). Light duty trucks typically use gasoline, as do many medium duty trucks. Heavy duty trucks use diesel fuel. Trucks and buses associated with the proposed action would be minimal, and would be well below the threshold of 21 diesel vehicles in a peak hour. Therefore, trucks and buses are not a source of concern for PM10/PM2.5 emissions.

3. Parking Facilities

The campus would provide a total of 755 parking spaces in open, at-grade parking lots, and on-street spaces. The three largest lots were selected for analysis. Each has over 150 spaces. They are shown in Table III/F-2. Smaller lots scattered around the site would have less than 35 spaces each.

Analysis of parking facilities typically focuses on the worst-case hour, which is usually the hour with the highest number of exiting vehicles in cold-start mode. As a worst-case analysis, all three of the large parking lots were assumed to be full, and the analysis is based on vehicle departing these lots at the same time.

Table III/F-2

Major Parking Lots and Traffic Volumes, 2010 Build Conditions

Location	Size (sq. ft.)	Spaces
North parking lot	61,875	178
South parking lot	78,750	183
West parking lot	118,125	310
Total	270,025	671

Source: Potomac Hudson Engineering, Inc. April 2006

CO concentrations from parking lots and garage emissions were calculated using methods from EPA's *Volume 9 Guidelines* as shown in the NYC *CEQR Technical Manual Appendices*. Analysis methods typically assume that:

- winter temperatures are in effect (worst case for CO emissions);
- incoming vehicles are in hot stabilized mode;
- exiting vehicles are in cold-start mode, and they idle for 60 seconds before leaving;
- speeds within the facility are 5 mph; and
- the average travel distance within a garage or lot is 2/3 times the length plus width of the facility.

EPA's MOBILE6.2 model was used to obtain emission factors for incoming (hot) and exiting (cold) motor vehicles. For the purposes of the parking lot analysis, a composite emission factor representing 76% autos (LDGV) and 24% SUVs (LDGT1) was used. This was based on information from a 2005 traffic study (Ridge Hill Village EIS, 2005) for a Saturday midday period at two intersections in Yonkers, NY: 1) Stew Leonard Drive and Sprain Road South, and 2) Tuckahoe Road and Grassy Sprain Road.

Table III/F-3 shows the results of the 8-hour CO analysis for the three large parking lots. "R1" represents the CO concentration for a receptor standing six feet from the shortest end of the lot, and "R2" represents the CO concentration for a receptor standing six feet from the longest end of the lot. The CO concentrations shown in Table III/F-3 must be added to the 8-hour background value of 2.5 ppm (2005 monitored value) in order to compare them to the NAAQS. All of the projected CO concentrations from the parking lots are within the NAAQS of 9.0 ppm.

Table III/F-3

Parking Lot CO Concentrations (ppm)

Parking Lot	8-Hour CO		Capacity
	R1	R2	
North Lot	0.1	0.1	178
South Lot	0.1	0.1	186
West Lot	0.1	0.1	310
Total			671

Note: CO does not include background concentration of 2.5 ppm
Source: Potomac Hudson Engineering, Inc.

A Saturday afternoon during an athletic event was used to project peak parking demand, as discussed in the project traffic study found in the DEIS Section III.E. During this period, nearly all of the spaces would be utilized. Therefore, the worst-case scenario is a period when the maximum number of vehicles exits a parking facility within a 1-hour period. This type of situation might occur when a football game lets out.

Table III/F-4 shows the calculated CO concentrations for the worst-case receptor point for each of the three selected parking facilities. The analysis assumes that exiting vehicles would be in cold-start mode, that they would idle for 1 minute before leaving, and that they would travel through the parking facility at 5 mph. Based on traffic information included in Section III.E of the DEIS, twenty-four percent of the vehicles were assumed to be SUVs, and 76 percent were passenger cars. Receptor points were placed at various points likely to receive the highest CO concentrations. Typically, this includes a point 6 feet from the edge of a parking lot. Only the worst-case receptor point is shown in Table III/F-4. All the projected CO concentrations for this scenario are within the NAAQS of 9.0 ppm.

Table III/F-4

Maximum Parking Facility CO, 2010 Build Conditions

Parking Facility	8-Hour CO Concentrations		
	Vehicular CO	Background	Total CO
North Lot	0.1	2.5	2.6
South Lot	0.1	2.5	2.6
West Lot	0.1	2.5	2.6

4. Stationary Source Impacts

The proposed structures would use electricity for lighting, power and cooling, as well as fuel oil or natural gas for heating and hot water. Potential impacts from fuel combustion emissions for heating and hot water are a function of fuel oil type, stack height, minimum distance from the source to the nearest building, and square footage of the projected development. Table III/F-5 shows this information for the proposed buildings. All buildings would be a maximum of 35 feet high, and stack height is assumed to be three feet higher than the roof. The distance to the nearest building of similar height is based on measurements from building edge to building edge. It does not account for the likely placement of stacks further back from the edge of the building.

For non-residential college buildings, Figure 3-Q3 from the NYC *CEQR Technical Manual Appendices* was used to determine the potential for impacts. For residential buildings, Figure 3-Q10 was used. Both graphs assume the use of natural gas. Since residential uses have greater emissions for a given square footage than non-residential college buildings, Figure 3-Q10 from the CEQR Technical Manual Appendices was used for the planned dormitories. The curves for 20-foot stacks were used. The graphs are a first stage screening analysis for potential impacts.

As indicated in Table III/F-5, eight of the nine buildings pass the screening analysis when the distances between the edges of the buildings are used. For the Main Library, the use of edge to edge distances is overly conservative. Where the configuration of the buildings allows the stacks to be set back an appropriate distance from the edge of the building, no impacts would occur. This is a reasonable expectation because boilers for heating and hot water are typically placed towards the center of a building, not near the edge. Furthermore, state and local legislation would regulate stack heights and distances between buildings in order to avoid impacts. If the Main Library uses natural gas instead of #2 fuel oil, then no impacts are likely.

Table III/F-5

Stationary Source Screen (Natural Gas)

Building Use	Building ID	Building Height (ft.)	Dist. to Nearest Building. of Similar Ht. (ft.)	Size (sq. ft.) Excluding Parking			Comments
				Non-Residential	Residential	Total	
Arts & Sciences	A.1	35	180 (G)	91,500			Screens out
Education	A.2	35	45 (C)	18,800			Screens out
Main Library	C	35	45 (A.2)	69,500			Use natural gas
Student Union	G	35	195 (A.1)	32,650		319,200	Screens out
Undergraduate Residence Halls	I	35	255 (A.2)		129,250		Screens out
Graduate Residence Dormitory	J	35	255 (A.2)		95,900		Screens out
Faculty/Staff Housing	K	35	405 (I,J)	43,200			Screens out
Athletic Center	L	35	765 (I,J)	129,600			Screens out
Physical Plant and Maintenance	M	35	570 (A.1)	18,000			Screens out
Retail (highest)							
Total				403,250	225,150	628,400	

Source: Potomac Hudson Engineering, Inc.

5. Short-Term Air Quality Impacts

Air quality impacts associated with short-term construction activities may include fugitive dust from movement of soil, exhaust and particulate emissions from diesel-fueled construction equipment, and emissions of from construction worker vehicles. Fugitive dust impacts from excavation and storage of materials are temporary in nature and will be mitigated by using best construction practices such as wetting the soil surfaces, covering trucks and stored materials with a tarp to reduce windborne dust, and proper maintenance of equipment. Typical erosion control measures include silt fences, wheel wash down areas, temporary seeding, outlet protection, dust control, temporary sediment traps and outlet control devices, covering of stockpile materials and hay bales. Exposed areas will be stabilized as soon as possible after disturbance to minimize dust. Soils will be stabilized with tackifiers (glues that tie mulch and soil together), geotechnical fabrics, natural ground coverings, and the establishment of seed beds. Roadway and haul roads will be stabilized with tackifiers, geotechnical fabrics and stone ballast as required to minimize dust. Tracking pads will be established where trucking vehicles move from construction areas to established roadways to prevent dirt from being tracked on to pavement. Wash stations will be installed at the tracking pads and their utilization will be required prior to leaving a disturbed area.

Blasting of rock during site construction can generate intermittent air-borne particulates on a short-term basis. Because blasting would be a short-duration activity, dispersal of dust to neighboring properties is the primary concern in terms of air quality. However, dispersal of dust after blasting can be reduced by wetting the area prior to blasting and/or blasting on days with low wind speeds (under 5 mph).

Rock processing operations that have the potential to generate dust, such as rock crushing, will be sprayed with water to control dust dispersal. Stockpiles will be covered and/or stabilized with an established seed bed to prevent windblown soil and dust from leaving the piles Roadways will be washed regularly to prevent dust from being generated by vehicle traffic. Dust associated with demolition activities will be controlled with misting systems that will minimize the generation of dusts. Best management practices will be included in the specifications of the construction contract.

c. Mitigation Measures

No long-term mitigation measures are needed for air quality. No significant adverse impacts to air quality are anticipated as a result of project-generated traffic. No significant adverse impact to air quality is anticipated as a result of boilers used for heating and hot water provided that the Main Library uses natural gas.

Best management practices would be implemented as appropriate during short-term construction phases to minimize unavoidable emissions of fugitive dust and emissions from trucks and on-site equipment.